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Western Regional Research Laboratory

M. J. Copley, Director

800 Buchanan Street, Albany 6, California

Bureau of Agricultural & Industrial Chemistry
Agricultural Research Administration

UNITED STATES DEPARTMENT OF AGRICULTURE

WESTERN REGIONAL RESEARCH LABORATORY

Organization

Office of the Chief, Bureau of Agricultural and Industrial Chemistry, Washington, D. C.

Chief of Bureau . . . . . G. E. Hilbert
Asst. Chief of Bureau . . . C. F. Speh
Asst. Chief of Bureau . G. W. Irving, Jr.
Asst. Chief of Bureau . Henry A. Donovan

Western Regional Research Laboratory, Albany, California:

Director . . . . . M. J. Copley
Asst. Director . . . W. B. Van Arsdel
Business Manager . . . . . S. J. Adams
Industrial Liaison . . . F. P. Griffiths
Technical Asst. to Director . R. H. Nagel
Mechanical Superintendent . P. L. Blake

Research Division Heads:

Fruit Processing . . . . R. R. Legault
Poultry Products . . . . H. Lineweaver
Vegetable Processing . . . H. S. Olcott
Biochemical . . . . . W. D. Maclay
Protein . . . . . G. H. Brother
Engineering & Development . W. D. Ramage
Physicochemical & Analytical . C. H. Kunsman

Other agencies of the Bureau of Agricultural and Industrial Chemistry located in the Western Region are included on pages 9 and 10.

VISITORS WELCOME

Visitors are always welcome Those interested in specific problems should consult Heads of Divisions listed on page 1 Hours 8 30 to 5 00 p m Monday through Friday Telephone Landscape 5-2244 Location and transportation Albany is across the Bay from San Francisco and north of Oakland and Berkeley The Laboratory is near the Bay shore From San Francisco buses traveling to Albany leave at the Bridge Terminal (See map page 12)

ORIGIN

In 1938 Congress provided for four regional research laboratories to search for new and wider outlets and markets for farm commodities The substance of the legislation is contained in the following paragraph

"The Secretary is hereby authorized and directed to establish, equip and maintain four regional research laboratories, one in each major farm producing area and at such laboratories to conduct researches into and to develop new scientific chemical, and technical uses and new and extended markets and outlets for farm commodities and products and byproducts thereof Such research and development shall be devoted primarily to those commodities in which there are regular or seasonal surpluses and their products and byproducts."

More recently Congress enacted legislation called the Research and Marketing Act of 1946 which authorized additional research on the utilization of farm commodities

ADMINISTRATION

The four Regional Research Laboratories are parts of the Bureau of Agricultural and Industrial Chemistry. In addition the Bureau includes a number of other research groups.

The Bureau is one of seven which constitute the Agricultural Research Administration. Through the Administration the scientific investigations of the United States Department of Agriculture are coordinated and working relationships are maintained with the State Agricultural Experiment Stations. P. V. Cardon is the Research Administrator.

The offices of the Bureau and the Agricultural Research Administration are located in Washington, D. C. G. E. Hilbert is Chief of the Bureau. C. F. Speh, G. W. Irving, Jr., and H. A. Donovan are Assistant Chiefs.

BUILDINGS

The buildings and facilities of the four regional laboratories are closely similar. Each building has three stories and basement and is built in the form of a U, with administrative activities in the base of the U and research work in the two wings. In one wing there is a large room, extending the full height of the building, where engineering laboratory operations, in some cases on a pilot-plant scale, are conducted.

The Western Laboratory has about 100 standard-sized laboratory rooms. The basement contains specialized laboratories, store rooms, and mechanical shops.

RESEARCH PROGRAM

Each of the Regional Laboratories engages in research on assigned commodities Those assigned to the Western Laboratory are

Alfalfa *Poultry* *Wheat*
Fruits *Vegetables*

Under the Research and Marketing Act of 1946 research is conducted also on

Rice *Wool* *Sugar Beets*
Dried Beans and Peas

These are major crops in the Western Region which includes Arizona California Colorado Idaho Montana Nevada New Mexico Oregon Utah. Washington and Wyoming Close relations through collaborative research and conferences are maintained between the Regional Laboratories and the State Agricultural Experiment Stations

There are seven Research Divisions in the Western Regional Laboratory each consisting of two or more Sections and 30 to 35 workers Names of the heads of the divisions are listed on page 1 A brief description of each Division s work follows

Fruit Processing Consists of three sections concerned with Raw Materials Products and Utilization and Appraisal Conducts fundamental research on raw material characteristics microbiological activity freezing and drying preservation and physical and chemical methods for retention of quality Searches for and applies information that contributes to improvement of existing processes Develops new products and processes designed to increase utilization and stabilize markets for fruits

Poultry Products The three sections are concerned with Poultry, Eggs and Utilization and and Appraisal Conducts research on improvement in quality of poultry products, on new products and on composition food values and industrial utilization of poultry products and their components

Vegetable Processing The sections are Raw Materials Products Utilization and Appraisal and Rice Utilization The objectives are much the same as those of the Fruit Processing Division --that is the work includes both fundamental studies and applications

Biochemical The three sections are Carbohydrate Biological Utilization and Alfalfa Typical carbohydrate research is that on low-methoxyl pectin Biological processes are being studied for utilization of processing wastes production of antibiotics and of mushroom mycelium Alfalfa research is concerned chiefly with stabilization of nutritive factors in dehydrated meal

Protein: The two sections are Wool and Wheat Methods of improvement in wool are being sought through studies of basic physical structure and response to treatment Research on wheat is concerned with the relation of protein composition and properties to milling and baking quality and extension of uses for gluten

Engineering & Development: Sections are Equipment Research Process Research Food Processing, and Industrial Analysis Work includes pilot-plant investigations; design, construction, and testing of equipment; collection and analysis of data on costs and potential markets; preparation of plant layouts for new processes.

Physicochemical and Analytical The Division consists of Analytical, Physics, and Physical Chemical Sections Applies physical and chemical analytical procedures including microchemical X-ray crystallographic and fluorometric methods and phase distribution and colloidal phenomena

ACCOMPLISHMENTS AND CURRENT PROGRAM OF THE WESTERN REGIONAL LABORATORY

Dehydration of Foods The major portion of the wartime research program was concerned with dehydrated foods particularly vegetables and eggs Results were reported on suitability of raw materials construction and remodeling of equipment and plants pretreatments such as scalding or blanching and applications of sulfite drying rates moisture contents packaging storage and testing Certain phases of this work have continued since the war Requirements for stabilization of egg powder were established Starch coating for dried carrots has proved especially noteworthy among recent research developments

Freezing Preservation of Foods Preservation of fruits vegetables poultry and eggs by freezing occupies a more important position in the Laboratory s program than previously New products include purees preserved by freezing without application of heat in the process--usable in or on baked goods or as desserts New processes include dehydrofreezing (partial dehydration followed by freezing) and absorption of sugar sirup by apple slices following vacuum treatment Numerous studies have been made

on factors involved in preservation of color, flavor, and nutritive value. A recent study has demonstrated the feasibility of packing frozen nonacid vegetables in sealed cans without danger from botulinum.

Cannery and Other Food Processing Wastes: Work on sanitation, chemical and physical changes in raw products, and on utilization of wastes is of major importance to food processing industries generally--especially research on utilization of wastes. The Laboratory has studied a considerable number of wastes by various extraction and fermentation procedures. The most elaborate of the fermentation studies has been concerned with yeast feed produced by *Torula utilis* in pear waste juice. The most elaborate extraction study has been that on low-methoxyl pectin. This study has included not only methods of extraction but also commercial uses for the modified pectins. Both of these studies and also others have been carried through pilot-plant stages so that data on actual production problems could be made available. Other waste-use investigations have included tartrates from grape wastes, ascorbic acid from walnut hulls, microbiological or fermentation media from asparagus butt juice, stabilized industrial protein from feathers, and lysozyme (antibacterial substance) from egg white.

This advanced information as well as other information developed by the Bureau and other research agencies is being used in assistance to food processors in meeting increasingly high standards in utilization and disposal of food processing wastes.

Industrial Utilization of Alfalfa and Wheat Improvement in the usefulness of alfalfa depends largely on the stabilization of carotene (provitamin A) and other nutritive factors in dried alfalfa meal Because it is a very large crop alfalfa is an important source of protein carotene and other feed values Since it is a forage or hay it is especially difficult to handle commercially as an ingredient of mixed feeds Studies at the Western Laboratory have contributed to basic knowledge of alfalfa carotene and its isomers, and preliminary experiments on milling of fresh alfalfa into juice and fiber fractions have been conducted

Research on wheat is limited to the gluten or protein part of wheat Accomplishments include a method of measuring the glutamic acid content of wheat protein and other exploratory investigations of the nature and possible uses of gluten More recent objectives include the characterization of chemical factors that are responsible for baking behavior of varieties of wheat

Fundamental Studies Included in this Bureau's program of research are many fundamental chemical and physical studies of agricultural raw materials and products Such studies are not sharply differentiated from studies of commercial applications and processes but they differ sufficiently to justify mention of several as being typical At the Western Regional Laboratory studies on egg white have revealed knowledge of several highly specialized proteins One (lysozyme) is an antibiotic Basic knowledge of this kind is of importance in the advancement of the

modern sciences of nutrition and medicine. Similarly knowledge of the fundamental molecular changes that occur in agricultural products is being sought as a foundation for continuing studies of industrial applications. A thorough understanding of the chemical reactions that cause browning of sliced apples peaches and other products is being sought since further development of control measures depends largely on the development of new fundamental knowledge. Use of the most advanced techniques in the study of enzymes microorganisms and physical processes is thus necessary.

OTHER RESEARCH UNITS OF BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY IN THE WESTERN REGION

Enzyme Research Division, A. K. Balls, Head. Located in the Western Regional Research Laboratory, Albany 6, Calif. This division is concerned with fundamental and practical studies of the enzymology of agricultural commodities and products. It is composed of three sections: Application Research, Fundamental Research, and Mechanism Research.

Pharmacology Laboratory, Floyd DeEds, Head. Located in the Western Regional Research Laboratory, Albany 6, Calif. This group serves the Bureau of Agricultural and Industrial Chemistry and other bureaus as an agency for the study of acute and chronic toxicity of various compounds being considered for their industrial usefulness.

Fruit and Vegetable Chemistry Laboratories. At the Fruit and Vegetable Chemistry Laboratory 263 South Chester Ave. Pasadena Calif research on citrus and other fruit products and on vegetable products is conducted E A Beavens is in charge of the Laboratory Recently the staff moved from a former location in Los Angeles to a new building in Pasadena which contains several laboratory rooms pilot-plant space and office

The Fruit and Vegetable Products Laboratory Washington State College Box 8 Pullman Washington is located on the campus of Washington State College A M Neubert is in charge In vestigations of fruit and vegetable processing problems are conducted

Natural Rubber Extraction & Processing investigations. These investigations are conducted at the U S Natural Rubber Research Station U S Department of Agriculture at Salinas Calif The Bureau of Industrial and Engineering Chemistry conducts studies on extraction processing and possible uses of byproducts I C Feustel is Head of these investigations The Bureau of Plant Industry Soils and Agricultural Engineering conducts research on production of natural rubber plants chiefly guayule

GENERAL INFORMATION ABOUT THE FOUR REGIONAL LABORATORIES

Laboratory	Mailing Address	Regional Area	Commodities Studied
Northern R. T. Milner Director	825 North University St., Peoria 5, Illinois	Ill., Ind., Iowa, Kans., Minn., Mo., Nebr., N.Dak., Ohio, S.Dak., Wis., Mich.,	Agricultural residues, corn, wheat, and other cereal crops, soybeans and other oilseed crops.
Southern W. M. Scott Director	2100 Robert E.Lee Blvd. New Orleans 19, La.	Ala., Ark., Fla., Ga., La., Miss., Okla., South Carolina, Tex.	Cotton, sweetpotatoes, peanuts, and rice.
Eastern P. A. Wells Director	Philadelphia 18, Pa.	Conn., Del., Maine, Ky., Md., Mass., N.H., N.J., N.Y., N.C., Pa., R.I., Tenn., Vt., Va., W.Va.	Eastern deciduous fruits, vegetables, tobacco, milk products, animal fats, leather, honey, maple products, and wool by-products.
Western M. J. Copley Director	800 Buchanan St., Albany 6, Calif.	Ariz., Calif., Colo., Idaho, Mont., Nev., N.Mex., Oreg., Utah, Wash., Wyo.	Fruits, vegetables, poultry products, alfalfa, wheat, rice, wool, sugar beets.

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